

THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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RASMUSSEN MAKING NEW ARCTIC DASH

REVEALS HUMAN SIDE OF NORTHERN LIFE

Danish Expedition Lead by Noted Explorer Sledging Way Across
Arctic Canada Headed Toward Asia - Seeks Relation of
Modern with Ancient Eskimos

Studying the natives of regions that are among the least known in the world, braving arctic hardships in order that a permanent record of Eskimo customs and legends may be obtained before contact with white men has spoiled these aborigines, a Danish scientific expedition, headed by Knud Rasmussen, the famous arctic explorer and ethnologist, is now making a long sledge journey across the northern-most part of Canada, far above the tree line, and near the arctic coast. This exploration party that already has been in the field for two years is headed toward Alaska and intends penetrating into the most frigid part of Siberia across Bering Strait.

On this one journey the party will travel over 3,000 miles, a longer distance than from New York to San Francisco. The total area in which the expedition is operating amounts to over 39,000 square miles.

Five scientists and an interpreter, with Eskimo hunters, make up the personnel of the Fifth Thule Expedition. Besides Rasmussen, the scientists are: Peter Freuchen, Terkel Mathiasen, Birket-Smith, and Helge Bangsted. The interpreter is Jacob Olsen, a Danish Greenlander. The expedition is named after its starting point, Thule, an arctic station on the northwest coast of Greenland. The motorship "Sokongen" took the expedition to its 1921-1922 winter quarters on the Melvi Peninsula directly north of Hudson Bay. After many side exploring trips into unknown country studying Eskimos who had never seen white men, the expedition, broken up into several parties taking different routes, made its way to a depot on Chesterfield Inlet on the upper edge of Hudson Bay. Here they prepared for the long sledge journey that is now in progress.

As a result of this journey, Rasmussen will make a thorough personal investigation and inspection of all Eskimo tribes from their Eastern outposts in Greenland to those furthest west on the Asiatic side of the Bering Sea. From this information he hopes to throw light on the origin of the Eskimo.

The party is equipped with motion picture cameras and is taking a living record of the landscape, animal life, and daily work and play of the various tribes for permanent record and comparison with pictures of other tribes of Eskimos in Greenland and elsewhere.

Besides its ethnographical and archaeological study, the expedition is mapping hitherto unknown territory, including parts of Baffin Land, said to be the third largest island in the world, is collecting geological specimens and fossils and is measuring the thickness of the ice covering in different sections of the Arctic Archipelago.

Knud Rasmussen

Knud Rasmussen was born in 1879 at Jacobhavn in North Greenland where he remained until he was 13 years old. As a university student he made a vacation journey to Lapland and the northern part of Norway. His first journey to Greenland was made in 1902 and continued until 1904 during which time he was a member of the Danish expedition under Mylius Erichsen. He travelled through South Greenland in 1905 to examine the possibilities for reindeer breeding.

From 1907 to 1913 Rasmussen made several journeys to Greenland, making sledge journeys to the far north, reporting on the political conditions, and establishing the trading station and expedition base of Thule in the Cape York district in 1910, where he stayed for three years. Another expedition to the North Greenland coast was made by Rasmussen in 1916, and in 1919 he arranged a third, which was under Capt. Godfred Hansen. Since then he has commanded two more expeditions to Thule and northern Greenland.

Rasmussen is the author of many books and magazine articles on the far north and is particularly an authority on the ethnology and folk lore of the whole region of north Greenland. He has received many decorations and is a member of several learned societies.

----- RASMUSSEN MEETS LAST SURVIVORS OF PRIMEVAL

ESKIMOS WHO HAD NEVER SEEN WHITE MEN

By Knud Rasmussen,
Leader, Danish Arctic Expedition
Now in Far North.

(This article was written and sent back to civilization from the northernmost part of Canada, Chesterfield Inlet on Hudson Bay.)

From Chesterfield Inlet to Yathkied Lake the country is inhabited by five Eskimo tribes, named Qaernermiut, Sharvartormiut, Padlermiut, Shaunertormiut, and Tashiusharmiut. While the Qaernermiut and the Shaunertormiut now partly live along the coast during the spring and the summer, the other three tribes are pronounced inland tribes, which only during the last generation or two have begun to make their way towards the sea.

This circumstance enabled us to obtain our most interesting results among these tribes, who have never been described before. Some of them had even never seen white men and looked at us in surprise and bewilderment, when we photographed them.

The only means of subsistence of these people are reindeer hunting and salmon fishing and all that has any connection with the sea is strictly taboo. Stone-houses are unknown, and during the winter they live in snow huts which are unheated as they have no blubber. The winter is very cold, often below minus 58 degrees Fahrenheit, and always very windy.

Until the last generation these inland dwellers have lived in hostility with the Indians of the Chipeqyan tribe and were consequently very wary and timid in their intercourse with strangers. In a few places women and children were shut up in the snow huts on our arrival, whereas the men received us silently, without the usual shouts of welcome, being evidently prepared against all possibilities. However, I had hardly begun to speak to them in their own language, and told them that we were friends and not enemies when they burst out into loud greetings and women and children came tumbling out of the snow huts.

Most Primitive People Yet Visited

Though I had no difficulty in understanding them, it took, however, always a day or two before they got accustomed to our dialect, because they had never before heard any other dialect whatsoever. In the beginning they were very reserved in their answers to our questions, declaring that they had neither legends nor religion nor any organization, but when once we had gained their confidence they were entirely changed.

They are the most primitive people I ever visited, and the material which I succeeded in collecting among them was something of a revelation to me. Their confidence went so far, that even the conjurers revealed their innermost secrets; old men and women told me legends and stories of trolls from the time of their ancestors, often legends which down to the minutest details were the same as I knew from Greenland - and in the evening we often met for festivals with songs and conjuring. Their conjuring is far simpler than the one we know from Greenland, just as their religion is on a much lower level than that of Greenland.

Whereas I was chiefly occupied in penetrating into their mental culture, Birket-Smith spent his time in studying their technical skill and implements, which were much more primitive and far fewer than the Greenland ones. Not one third of the Greenland implements are known here, and there is every indication that the tribes never lived near the sea.

It is interesting to remember that the Eskimos, according to the opinion of late Professor Steensby of the University of Copenhagen, were originally an American inland tribe, which had wandered out to the Arctic coast, and it seems as if we here have found the corroboration of this theory.

In all probability we have here in the inland tribes on Barren-Grounds found the last surviving remainders of the primeval Eskimos, a survival from the time when the Eskimo people had not yet reached the sea.

Starve Several Months

Hunting conditions at the time of our visit were extremely unfavorable, and most of the dwelling places were in extreme distress. I met human beings, so worn out with several months starvation, that they could not walk. As regards the wanderings of the reindeer, the animals which during the winter frequent the northern part of the wood, proceed in several moves from south to north; the first move in May consisting of herds from fifty to several hundreds, as a rule, cows in calf and one year old calves; later on scattered moves of small herds, cows and young animals; in June and at the end of July the bulls in herds of several thousands, which herds pass the west coast of Baker Lake in a northerly direction. In the autumn all of these animals return again to the woods. Between the moves and during the winter, the animals are only met with scattered here and there, and as the Eskimos only hunt the reindeer which pass just by their dwelling places, they are often reduced to starvation.

Five Days and Nights Without Food

Birket-Smith and Bangsted were so unlucky as to undertake a journey to Baker Lake during one of those very periods when there were no reindeer, and in spite of their being accompanied by natives who thoroughly knew those regions, they had such difficulties in getting game that on their arrival at Baker Lake they had gone five days without food. When a couple of weeks later, Bangsted went some distance up the Kazan River in order to fetch a depot, he, together with his native companions, were caught up by such an enormous herd of reindeer - all bulls - that they had to fire at them for fear of being trodden underfoot.

----- SWEDISH EXPOSITION TRACES RISE OF SCIENCE

Many of the mightiest strides of science through the ages are vividly illustrated in the Tercentennial Jubilee Exposition in Gothenburg which is now open and will continue through the summer. Recent inventions are sharply contrasted with objects serving similar purposes in times even as long ago as the stone age, and in some departments it is possible for the visitor to trace out a complete chain of development in scientific achievement.

Archaeology has proved that the region where Gothenburg now stands was inhabited at least 5,000 years ago, by the ancestors of the present Swedes. One of the most interesting exhibits at the Exposition is a well-preserved skeleton of a man who lived in the Stone Age, 5,000 years ago, and who had evidently met his death on what was then the western sea shore of Sweden. With his skeleton was found a two-edged axe. This crude weapon, which was also a tool, contrasts strangely with the exhibits of modern cutlery, surgical instruments, and delicate tools which have become possible through the unusual refinement of Swedish steel.

From the Stone Age also comes an actual boat which was discovered near Gothenburg. Though made of wood, this boat has, curiously enough, been fairly well preserved through fifty centuries. One can see that it was constructed by burning out the inside of a log, which was afterwards trimmed with a flint axe. This rare relic, certainly one of the oldest marine objects in the world, is item No. 1 in the Navigation Exhibition of the fair, which, according to experts,

is the most complete of its kind ever prepared. Four hundred ship models alone are on display, and every phase of navigation is illustrated, whether the propelling power is furnished by oars, sail, steam, or oil. Not far away is an actual Swedish marine motor of the Diesel type said to be the largest in the world. This is a four cycle, six cylinder motor, developing 2,000 horse power. It is designed for a new Swedish motor-ship of 10,000 tons.

Up-to-date navigation under steam is represented by the well-known Swedish invention, the de Laval geared turbine engine, and by the Stal turbine engine. Another Swedish invention that has been attracting much attention at the fair is the "vapor accumulator", which is used in many steam power plants in Europe and America. The company which manufactures "accumulators" is now planning to install them on steamships which make short regular trips. Thus a ship may be run by steam, and yet have no firing done on board!

One of the most striking examples of mechanical achievement through a long succession of inventions is illustrated in the Gothenburg exhibition of light-houses and buoys. In the days of the Vikings night beacons consisted principally of wood fires built on hilltops or conspicuous rocks at times when ships were expected to return. Then came the coal fire beacon, of which the earliest known in Sweden was built in 1202. The coal was burned in an iron basket hoisted high by means of a long lever. But Sweden had no continuously tended lighthouse until 1635. Then came a long period of steady improvement which in 1904 culminated with the first use of the automatic gas light buoy, invented by the blind Swedish inventor, Gustaf Dalen, called "the Edison of Sweden". These buoys, which guide ships into New York Harbor, and into many other important harbors of the world, can operate absolutely without attention as much as a year at a time, and have an uncanny way of lighting up automatically whenever the sky gets dark, whether the darkness is due to a storm, an eclipse, or night fall. The secret lies in the Dalen sun valve which is extremely sensitive to light. Another invention of Dr. Dalen, turned out by him after he had lost his eyesight during experiments, is the "aga" light, an electric lamp which imitates daylight.

One of the most prized exhibits at the Exposition is an actual "hot air engine", which was invented and built by John Ericsson, whose fame does not rest solely on the "U. S.S. Monitor" and the screw propeller. This is one of the features in the "Swedes in Other Lands Exhibition".

EINSTEIN'S NEW GRAVITATION THEORY INVOLVES FIVE DIMENSIONS

Einstein's theory of gravitation as a static twist of matter in the fourth dimension and in the direction of the fifth dimension was explained in pictorial and non-mathematical language by Dr. Paul R. Heyl, physicist at the Bureau of Standards, in a recent lecture before the assembled scientists there. Dr. Heyl recently weighed the biggest topaz crystal in the world with an accuracy of one part in a billion in an effort to disprove some of Einstein's theories, an effort which he said had been so far entirely unsuccessful.

Even the scientists gasped when Dr. Heyl announced that Einstein's concept of gravitation involved two more dimensions than anyone has ever seen outside of a mathematical formula; but it became more understandable when Dr. Heyl used our familiar three dimensions as illustrations. A flat surface of calm water exists

in but two dimensions, but if it is agitated by waves it is twisted or strained up and down, that is, in the direction of the third dimension. If these waves were imagined to remain rigid and immovable the situation was then parallel to the strain of the four-dimensional space which Einstein imagines in the direction of an additional or fifth dimension.

As an illustration of how gravitation might actually work, Dr. Heyl went back to the illustration of the waves and showed that two particles in the trough of a wave would tend to draw together, being pulled "downhill" by the force of the earth's gravitation. According to Einstein's ideas, something similar may be responsible for the universal prevalence of gravitation. All matter causes a strain or deformation of the four dimensions, and the tendency to get rid of this strain, or as the physicists put it, to get into positions where potential energy is lowered, is what we sense as the phenomenon of gravitation.

Whether true or false, Einstein's ideas were characterized by Dr. Heyl as the first positive contribution to our knowledge of what gravitation is since Newton elaborated his famous laws two and a half centuries ago. Since then more than thirty theories had been put forward to explain gravity, none of which contributed any real or positive knowledge, while Einstein's theories had been corroborated by two sets of facts not accounted for by Newton, the variations in the orbit of the planet Mercury and the deviation of light by a strong gravitational field.

All our knowledge of gravitation, Dr. Heyl said, shows that it is absolutely independent of anything except the mass and the relative positions of the two bodies which attract each other, or as the mathematicians concisely express it, their "geometric co-ordinates". It has nothing to do with the kind of matter, with its motion, its temperature, its electrical condition, or form of chemical combination. Matter is matter, and all acts alike. It seems evident then that gravitation is something entirely outside of matter as we understand it, a result of its relative or actual position in space.

Dr. Heyl endeavored by his experiments in the weighing of crystals to show that it depended upon the position of matter in our familiar three dimension space, that a crystal would vary in weight according to the position of its faces and axes in relation to the earth. No effect of the kind was found although practically every other physical property of crystals is affected by its position.

It seemed reasonable then, Dr. Heyl stated, that Einstein might be right; at least he was not proved to be wrong. Dr. Heyl said he had approached the investigation with a prejudice against Einstein's views; he had summoned up his physical witnesses in the same spirit that old Balak, King of Moab, had summoned Balaam, the soothsayer, to curse the hosts of Israel, and now he was in the position of the king who, as related in the Old Testament story, exclaimed.

"I called thee to curse my enemies, and behold thou hast blest them altogether."

An X-ray motion picture of the contractions of the human heart was shown before a Congress of German Medical Experts in Munich recently.

ETNA'S ERUPTION WON'T CHANGE THE WEATHER

The recent eruption of Etna was not of the type which sometimes causes marked variation in weather over fairly long periods. Prof. W. J. Humphreys of the U. S. Weather Bureau stated in reply to an inquiry by Science Service. Although the volcano emitted a great quantity of ashes, some of which have recently been reported to have fallen in the Alps many hundreds of miles away, Prof. Humphreys did not think enough, if any of them, had gotten into the upper atmosphere to cause weather changes over a period of months.

Volcanic eruptions have sometimes done this. After the famous eruption of Krakatoa in the East Indies in 1883, the winter was unusually cold and the cold was general throughout the world. Similarly the "year without a summer" as 1816 is known, was preceded by the great eruption of Tomboro in the East Indies. Other eruptions have had similar effects owing to the shading of the earth from the sun's rays by the fine haze of ashes, floating in the upper atmosphere and carried all over the world.

But Etna is not primarily an explosive volcano, said Prof. Humphreys. It generally just boils over as it did this time. The explosions are not severe as volcanic explosions go. Krakatoa's 1883 explosion was heard 2,000 miles away, Etna's eruptions are not strong enough to throw any great volume of ashes nine or ten miles above the surface which would be necessary to get them above the highest clouds from where they might be dragged down into the general circulation of the atmosphere. If the weather grows cool from now on, Etna is not responsible.

Dr. Edwin E. Slosson

CHATS ON SCIENCE
-----THE ADVANTAGE OF TAN

The Ethiopian cannot change his skin but the white man can. That is where the white man has the advantage for when he is exposed to the sun he gradually becomes a colored man. (The negro is not a "colored" man; he was born so.)

The white skin automatically protects itself against the injurious action of the sun's rays by developing a layer of dark pigment in the deeper part of the epidermis. That is, the brunettes and the tannable blonds have this power. The incorrigible blonds that burn and blister will have to stay in the house or take to charcoal face powder.

Black looks black to us because it absorbs and keeps the visual rays of light. White looks white to us because it reflects them back to our eyes. White clothing is therefore better than black in the tropics because it sheds sunshine better. Black cloth absorbs about twice as much of the visible rays as white.

We might conclude from this that a white skin would be better than black in warding off sunshine. And so it would if heat were the only thing involved.

But it is not. The sun's rays contain, besides the heat that we feel and the light that we can see, certain rays that we can neither feel nor see but which have a powerful effect upon the skin for good or ill. These are the rays that have a shorter wave length than the violet which are the shortest that can be seen. They are therefore called the "ultra-violet". Ordinary sunshine contains only about one per cent. of these ultra-violet rays; more if the air is dry, less if it is damp. Of the rest of the solar radiation about 19 per cent. is in the form of visible light and about 80 per cent. in the form of dark heat or "infra-red" rays. The heat rays are absorbed about the same whether the skin or clothing be black or white.

But with the short-wave rays at the other end of the spectrum it is different. These are more energetic than the long-wave rays but are more easily discouraged and do not penetrate so far into the skin. If you hold up your hand and look through it toward the sun you will see that the light that gets through the thin parts of the fingers looks red. That means the long red waves, and of course the longer heat waves, go through the flesh while the short violet waves, and of course the shorter ultra-violet, are caught and held in the flesh.

This fortunate for the ultra-violet rays are fatal to the living cells of the body. The X-rays that have waves ten thousand times shorter than the ultra-violet are so powerful that they are used to burn away cancers. The visible rays of short wave length are still strong enough to cause sunburn.

What we need then in the skin is some sort of a contrivance that will take these short light and ultra-light waves and transform them to the harmless heat waves, what the electricians call a "step-down transformer".

Well, we have such a contrivance in tan. First the thin horny outside layer of the skin catches and converts to heat the ultra-violet. Then the short-wave visible rays, violet and blue, are caught by the pigmented cells lying beneath. The longer waves, the yellow, red and infra-red, penetrate further but do no harm except to make us warmer. A thin-skinned person well tanned is better off than a thick-skinned person because the former is sufficiently protected against the lethal rays and yet can get rid of his own internal heat more readily by radiation through his thin skin.

The tan serves another purpose than mere protection. For the nerve endings lie between the pigment cells and when they are excited by the heat from the transformed light they dilate the vessels in the skin and so send out the sweat which by evaporation cools off the body.

It seems that ultra-violet and violet rays may be positively beneficial when properly transformed by a coat of tan. Rickets and tuberculous sores are reported to be cured by the exposure to direct sunlight but not by that which has been passed through glass for this filters out the ultra-violet rays.

It is not necessary to carry the pigmentation to an extreme as the negro does. A good browning will insure against the injurious and secure the beneficial effects of sunning.

CATTLE EAT BONES WHEN PHOSPHATE HUNGRY

Cattle so crave a certain substance which is lacking from their food in some districts in South Africa that they eagerly search for the bodies of dead animals and greedily devour their bones even though flesh still clings to the skeleton and even though the dead animal be one of their own mates. Such is the statement of Dr. H. H. Green of the Division of Veterinary Research at Pretoria, South Africa, in a recent report on this strange condition made to the American Society of Biological Chemists.

Osteophagia, as this bone eating habit of the cattle is technically termed results directly from a lack of sufficient phosphorus in the food to adequately supply the body; the low content of this element in the food can be traced to the very small amount of it in the soil. The animals have learned by experience that bones are a very rich source of the substance which they crave since the skeleton is made up almost entirely of calcium phosphate and they satisfy their desire for phosphates just as many animals gratify their appetite for salt at salt licks. Acute osteophagia occurs in almost all the animals in certain regions for about ten months in the year, according to Dr. Green, and only abates for about two months while the grass is very young. This disease can be entirely prevented, experiments proved, by the use of phosphate manuring in the soil or by the administration of phosphate to the animals effected but in the latter case it reappears again when this substance is removed from the diet.

According to this scientist, osteophagia in itself does not usually result fatally although it may effect the growth of young cattle or lessen the production of milk in cows, results which are also attributable to the low phosphate content of the food. Its economic importance lies in the fact that it is indirectly the cause of a fatal bovine disease, common in South Africa, which is known as lamziekte. This latter disease, characterized by a paralysis of the throat and neck muscles, lameness, and a humping of the back, is caused by a toxin produced by microorganisms harbored in decaying flesh. The bone eating animals in their attempt to gratify the desire for phosphate eat bones together with adhering putrid flesh; this flesh too often contains the toxin which causes lamziekte.

BIG PLANES NOW USED IN FIGHT AGAINST WEEVILS

The U. S. Department of Agriculture is bringing up the heavy artillery in its fight against the cotton boll weevil. Three DeHaviland 4B planes are to be used to poison the weevils from the air by dusting the plants with calcium arsenate. Several plantations around Tallulah, La. have been mapped and all arrangements made for the test which will be awaited with interest by every one connected with the cotton industry.

Four applications of the poison will be made during the season, five pound of the poison being used to the acre at each application. The chemical is sifted out of a specially designed hopper while the plane is flying at low altitudes, mostly from fifty to 200 feet.

Although extremely fatal to the weevils, there is no danger to human being or to farm animals, in the opinion of the experimenters, from the use of the poison.

TABLOID BOOK REVIEW

THE PRESENT STATUS OF VISUAL SCIENCE; By Leonard Thompson Troland.
Bulletin of the National Research Council of the National Academy
of Sciences. No. 27, Vol. 5, Part 2. December, 1922.

To what extent do we see with our eyes and to what extent with our minds,
and just how does each do its work?

This is an outline of the many problems connected with vision which are
presented in this volume of 112 pages which gives an outline of the most modern
views on the problem of vision. The author discusses the process of seeing,
from the emanation of light energy from the object seen to the interpretation
by the brain of the images received upon the surface of the retina. Every step
in the process receives due attention. The book is written primarily for
readers trained in science and familiar with technical terms; the lay reader
will find it hard reading. A copious bibliography is one of the most important
features of the work. E.S.C.

One of the fossil dragon flies has a wing spread of more than two feet.

Flattening of the back of the head results in compensatory increases in
the breadth of the head and face, examination of 435 American soldiers indicates.

A woman scientist, dying from tetanus produced by an accidental gun shot
wound while collecting snakes and insects in the woods of Panama, was recently
rescued by an airplane flying over her camp and dropping the necessary anti-
tetanus serum.

Half of the lichens and nearly a third of the mosses of the Antarctic are
also found in the Arctic.

The windmills that once dotted the Belgian landscape and furnished motive
power for innumerable operations on Flanders farms are slowly being replaced by
more efficient power machinery.

Plans for the development of the French telephone service, involving an ex-
penditure for new equipment of 200,000,000 francs a year for ten years, are under
consideration by the French government.

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INDIVIDUAL SUBSCRIPTIONS TO

WHY THE WEATHER

In response to requests from individuals it has been decided to make "Why The Weather", a Science Service newspaper feature, available in mimeographed form to individuals who agree not to allow publication of this feature from the copy that is furnished them. These notes are being furnished to about 30 newspapers throughout the country and the series which was begun on May 14 is to run for at least six months.

Dr. Charles F. Brooks, secretary of the American Meteorological Society is the author of the notes in cooperation with Mr. John Nelson of the Worcester Evening Gazette, and with the editorial aid of the U. S. Weather Bureau through Dr. W. J. Humphreys.

The authors of the notes and Science Service have foregone any profit in order that the price of individual subscriptions, mailed in weekly batches, for six months, shall be \$1.25, postpaid.

It is hoped that those interested in "Why The Weather" will call the attention of their local newspaper to this service which may be obtained from Science Service at a nominal price per week. If the name of an editor or newspaper is sent to Science Service, a sample of "Why The Weather" will be sent with full information.

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For the \$1.25 enclosed please send me the individual edition of "Why The Weather" for six months beginning with May 14. In accordance with your explanation, I understand that this is for my own personal use only and will not allow publication of these articles from this copy.

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